

## **ABSTRACT OF THE DISCLOSURE**

A torque sensing apparatus for picking up a magnetic flux in response to applying a torque to a shaft is disclosed. A magnetostrictive material is disposed on the surface of the shaft and is magnetically polarized. The apparatus includes a first 5 flux collector and a second flux collector spaced from each other and extending annularly around the shaft. A first fluxgate is connected to the first flux collector at one end and to the second flux collector at the other end with a first excitation coil wound about the first fluxgate. A second fluxgate is connected to the first flux collector at one end and to the second flux collector at the other end with a second 10 excitation coil wound about the second fluxgate. A feedback coil is positioned between the shaft and the flux collectors, the fluxgates, and the excitation coils.